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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/046,742	01/17/2002	Katsuhiko Namba	2185-0612P-SP	2564

2292 7590 07/28/2003

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EXAMINER

THORNTON, YVETTE C

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 07/28/2003

4

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application N .

10/046,742

Applicant(s)

NAMBA ET AL.

Examiner

Yvette C. Thornton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

This is written in reference to application number 10/046742 filed on January 17, 2002 and published as US 2002/0147259 A1 on October 10, 2002.

#### *Information Disclosure Statement*

1. The Information Disclosure Statement filed on May 17, 2002 has been entered and fully considered.

#### *Priority*

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### *Double Patenting*

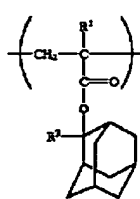
3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

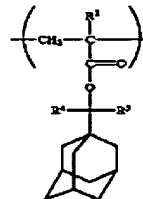
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Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of copending Application No. 10/254598 (US 2003/0099900 A1) in view of Urano et al. (US 5976759 A). The said copending application claims a chemically amplification type positive resist composition comprising (A) a resin having a polymerization unit derived from p-hydroxystyrene and a



or formula (2)



wherein, R1

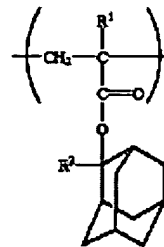
polymerization unit of the formula (1)

and R<sub>2</sub> are independently H or methyl group, R<sub>3-5</sub> each represent an alkyl group having 1 to 8 carbon atoms; (B) a resin obtained by protecting apart of the hydroxyl groups in the poly(p-hydroxystyrene) by a protective group; and (C) an acid generating agent. Specifically claim 2 claims a composition wherein R<sub>1</sub> and R<sub>2</sub> are methyl and R<sub>2-5</sub> are each methyl or ethyl. It is the examiner's position that the limitations of the instant claims are met when R<sub>1</sub> of Formula (1) is either hydrogen or methyl and R<sub>3</sub> is an ethyl group.

The said application fails to teach the use of polypropylene glycol as set forth in the instant claims. However, the examiner is of the position that polypropylene glycol is a well-known and conventional surfactant, which is added to compositions in order to improve the film forming properties, wettability and striation resistance. This position is supported by the teachings of Urano, which discloses that suitable nonionic surfactants include polyethylene glycol distearate, polyethylene glycol and polypropylene glycol (c. 30, l. 37-39; c. 31, l. 28-46). It would have been obvious to one of ordinary skill in the art, based on the claims of Yamada (10/254598) and what is known in the art as disclosed by Urano, to make

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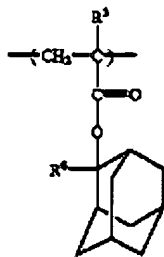
a photoresist composition comprising (A) a resin having a polymerization unit derived from



p-hydroxystyrene and a polymerization unit of the formula (1) wherein R3 is an ethyl group; (B) an acid generating agent; and (C) a surfactant such as polypropylene glycol in order to obtain a composition which has improved film forming properties. The examiner notes that the comprising language of the claims fails to prohibit the presence of the claimed second resin.

*This is a provisional obviousness-type double patenting rejection.*

5. Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 4/3/1 of copending Application No. 10/233519 (US 2003/0114589 A1) in view of Urano et al. (US 5976759 A). The said copending application claims a resist composition comprising (1) a novolak resin; (2) a resin having at least one structural unit selected from formulae (IIa), (IIb) or (IIc) and has a structural unit derived from p-hydroxystyrene; and (3) an acid generator. Said formula (IIa)



has the structure

wherein R3 represents a hydrogen or methyl group, R6

represents an alkyl group having 1 to 8 carbon atoms. It is the examiner's position that the

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limitations of the instant claims are met when R3 of Formula (IIa) is either hydrogen or methyl and R6 is an ethyl group.

The said application fails to teach the use of polypropylene glycol as set forth in the instant claims. However, the examiner is of the position that polypropylene glycol is a well-known and conventional surfactant, which is added to compositions in order to improve the film forming properties, wettability and striation resistance. This position is supported by the teachings of Urano, which discloses that suitable nonionic surfactants include polyethylene glycol distearate, polyethylene glycol and polypropylene glycol (c. 30, l. 37-39; c. 31, l. 28-46). It would have been obvious to one of ordinary skill in the art, based on the claims of Suetsugu (10/233519) and what is known in the art as disclosed by Urano, to make a photoresist composition comprising (A) a resin comprising a resin having a structural unit derived from p-hydroxystyrene and a unit of formula (IIa) wherein R6 is an ethyl group; (B) an acid generating agent; and (C) a surfactant such as polypropylene glycol in order to obtain a composition which has improved film forming properties. The examiner notes that the comprising language of the claims fails to prohibit the presence of the claimed novolak resin.

*This is a provisional obviousness-type double patenting rejection.*

6. Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 4/1 of copending Application No. 10/084182 (US 2002/0164540 A1) in view of Urano et al. (US 5976759 A). The said copending application claims a chemical amplifying positive resist composition comprising (A) a resin having a polymerization unit derived from hydroxystyrene and a polymerization unit derived from (meta)acrylic acid 2-methyl-2-adamantyl or (meta)acrylic acid 2-ethyl-2-

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adamantyl; (B) an acid generating agent; (C) a basic compound; and (D) a polyvalent carboxylic acid ester. It is the examiner's position that (meta)acrylic acid 2-ethyl-2-adamantyl is structurally analogous to 2-ethyl-2-adamantyl (meth)acrylate as set forth in the instant claims.

The said application fails to teach the use of polypropylene glycol as set forth in the instant claims. However, the examiner is of the position that polypropylene glycol is a well-known and conventional surfactant, which is added to compositions in order to improve the film forming properties, wettability and striation resistance. This position is supported by the teachings of Urano, which discloses that suitable nonionic surfactants include polyethylene glycol distearate, polyethylene glycol and polypropylene glycol (c. 30, l. 37-39; c. 31, l. 28-46). It would have been obvious to one of ordinary skill in the art, based on the claims of Nakanishi et al. (10/084182) and what is known in the art as disclosed by Urano, to make a photoresist composition comprising (A) a resin comprising a resin having a structural unit derived from hydroxystyrene and a unit (meta)acrylic acid 2-ethyl-2-adamantyl; (B) an acid generating agent; and (C) a surfactant such as polypropylene glycol in order to obtain a composition which has improved film forming properties. The examiner notes that the comprising language of the claims fails to prohibit the presence of the claimed basic compound and polyvalent carboxylic acid ester.

*This is a provisional obviousness-type double patenting rejection.*

7. Claim 1 is directed to an invention not patentably distinct from claims 1-2 of commonly assigned Application No. 10/254598 (US 2003/0099900 A1); 4/3/1 of commonly

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assigned Application No. 10/10233519 (US 2003/0114589); and claim 4 of commonly assigned Application No. 10/084182 (US 2002/164540 A1) as discussed above.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP § 2302). The commonly assigned applications discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee is required under 35 U.S.C. 103(c) and 37 CFR 1.78(c) to either show that the conflicting inventions were commonly owned at the time the invention in this application was made or to name the prior inventor of the conflicting subject matter. Failure to comply with this requirement will result in a holding of abandonment of the application.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications filed on or after November 29, 1999.

*Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

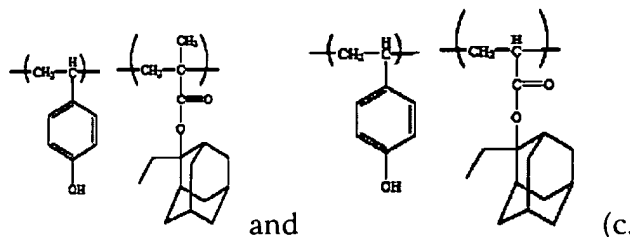


9. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being obvious over Uetani (US 6548,220 B2) in view of Nakurama et al. (US 6514656 B1).

Uetani teaches a positive chemically amplified positive resist composition which comprises (A) an acid generator containing (a) a sulfonium salt represented by formula (I) and (b) at least one onium salt selected from the group consisting of a triphenylsulfonium salt of formula (IIa) and a diphenyliodonium salt of formula (IIb); and (B) a resin which has a polymerization unit having a group unstable against an acid and is alkali insoluble, but converted to alkali soluble by the action of an acid (c. 1, l. 65-c. 3, l. 4). It is the examiner's position that the taught sulfonium and onium salts meet the limitations of instant claim 4. The said resin preferably comprises (meth)acrylic acid-2-alkyl-2-adamanyl monomers because of the excellent resolution of the leaving group. Typical examples include acrylic acid-2-ethyl-2-adamantyl and methacrylic acid-2-ethyl-2-adamantyl, which are particularly preferred because of the good balance between the sensitivity and the heat resistance (c. 22, l. 38-56). The said resin may further contain a polymerization unit, which is not cleaved by an acid. Examples include (meth)acrylic acid, maleic acid anhydride, itaconic acid anhydride, 2-norbornene and (meth)acrylonitrile. Hydroxystyrene is not preferred for ArF exposure but it is very suitable for use with KrF exposure because there occurs no problem of light absorption (c. 22, l. 63-23, l. 53). Particularly, it is preferable in terms of adhesion of the resist to a substrate that at least one polymerization unit selected from a polymerization unit selected from the group consisting of p-hydroxystyrene, m-hydroxystyrene, (meth)acrylic acid 3-hydroxy-1-adamantyl and the like is copolymerized. For KrF excimer laser exposure, even if

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the polymerization unit of hydroxystyrene is used as the polymerization unit of a resin, sufficient transmittance can be obtained (c. 24, l. 61-66). Suitable examples of p- or m-



hydroxystyrene copolymer resins include:

26, l. 15-55). Uetani teaches that 2-alkyl-2-adamantyl or 1-adamantyl-1-alkylalkylalkyl groups are more advantageous in terms of dry etching resistance (c. 28, l. 1-3). One of ordinary skill in the art would have been motivated by the teachings of Uetani use the resin comprising hydroxystyrene and 1-alkyl-2-adamantyl groups as shown above in combination with onium salts to make a photoresist composition which has improved dry etch resistance, a good balance between sensitivity and heat resistance and is suitable for use with KrF exposure.

Uetani teaches all the limitations of the claimed invention except it fails to teach the use of polypropylene glycol as claimed by the applicant. Uetani does however teach that the taught composition may also contain, if required, small amounts of various additives such as sensitizers, dissolution inhibitors, other resins, surfactants, stabilizers and dyes so far as the objects of the taught invention are not harmed (c. 30, l. 52-59). Nakamura discloses that plasticizers such as tricresyl phosphate, dimethylphthalate, polyethylene glycol and polypropylene glycol are added to resist composition to impart flexibility to a film. The amount to be added is usually from 0.5-30% by weight of the total weight of the solid components of the said composition (c. 35, l. 31-41). Although Nakamura fails to disclose

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the molecular weight of the polypropylene glycol used, it would have been obvious to one of ordinary skill in the art to optimize the molecular weight of the plasticizer to obtain optimal results. It would also have been obvious to one of ordinary skill in the art to incorporate a plasticizer such as polypropylene glycol, as taught by Nakamura, into the taught composition of Uetani in order to improve flexibility and abrasion resistance of the formed film.

10. The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

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*Conclusion*

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Kim et al. (US 2003/0119957 A1) pertaining to a resist composition (see ref. Ex. 6, 8).
- Uetani et al. (US 6495306 B1) pertaining to a chemically amplified positive resist composition.
- Urano et al. (JP 10-048826, abstract) pertaining to a polymer composition and resist material containing the same.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 703-305-0589. The examiner can normally be reached on Monday-Thursday 8-6:30.

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet C. Baxter can be reached on 703-308-2303. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

14. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1495.



Yvette Clarke Thornton  
Junior Examiner  
Art Unit 1752

yct  
July 24, 2003